CLAIMS

1. A carrier protein comprising at least five CD4+ T cell epitopes.

2. A carrier protein according to claim 1, wherein the CD4+ epitopes are derived from a pathogenic bacterium or virus.

3. A carrier protein according to claim 1 or 2, wherein the CD4+ epitopes are derived from tetanus toxin, *Plasmodium falciparum* circumsporozite protein, hepatitis B surface antigen, hepatitis B nuclear core protein, influenza matrix protein, influenza haemagglutinin, diptheria toxoid, diptheria toxin mutant CRM 197, group B *Neisseria meningitidis* outer membrane protein complex, pertussis toxin or heat shock protein 70.

4. A carrier protein according to any one of the preceding claims wherein the CD4+ epitopes are selected from the P23TT, P32TT, P21TT, PfCs, P30TT, P2TT, HBVnc, HA, HbsAg, MT and hsp70 CD4+ epitopes.

5. A carrier protein according to claim 1, that comprises the P23TT, P32TT, P21TT, PfCs, P30TT, P2TT, HBVnc, HA, HbsAg and MT CD4+ epitopes.

6. A carrier protein according to claim 1, that comprises the P23TT, P32TT, P21TT, PfCs, P30TT, P2TT, HBVnc, HA, HbsAg, MT and hsp70 CD4+ epitopes.

7. A carrier protein according to claim 1, that comprises the P23TT, P32TT, P21TT, PfCs, P30TT and P2TT CD4+ epitopes.

8. A carrier protein according any one of the preceding claims, wherein the CD4+ epitopes are human CD4+ epitopes.

9. A carrier protein which comprises one or more of N6, N10 or N19 proteins.

10. A carrier protein according to any one of the preceding claims in an oligomeric form.

11. A carrier protein according to any one of the preceding claims, conjugated to polysaccharide.

12. A carrier protein according to claim 11, wherein the polysaccharide is an *Haemophilus influenzae* type B polysaccharide.

13. A carrier protein according to claim 11, wherein the polysaccharide is derived from any one of the following organisms: *S. pneumoniae, N. meningitidis, S. aureus, Klebsiella,* or *S. typhimurium.*

14. A carrier protein according to any one of claims 11-13 where the polysaccharide is conjugated to protein by a covalent linkage.

15. A carrier protein according to claim any one of claims 11-13, wherein the polysaccharide is conjugated to protein by reductive amination.

16. A carrier protein according to any one of claims 11-15, wherein there are between two and ten protein units for each polysaccharide unit.

17. A carrier protein according to any one of claims 1 to 16 for use as a pharmaceutical.

18. Use of the carrier protein according to any one of claims 1 to 16 as a pharmaceutical.

19. The carrier protein according to any one of claims 1 to 16 for use as a vaccine or as a component of a vaccine.

20. Use of a carrier protein according to any one of claims 1 to 16 as a vaccine or vaccine component.

21. A vaccine comprising a carrier protein according to any one of claims 1 to 16.

22. A method of production of vaccination comprising introducing into a mammal, preferably a human, a carrier protein according to any one of claims 1 to 16.

23. The carrier protein according to any one of claims 1 to 16 for use as a protective immunogen in the control of diseases caused by encapsulated bacteria.

24. A nucleic acid molecule which encodes a carrier protein according to any one of claims 1 to 10.

25. The nucleic acid molecule of claim 24 which comprises DNA.

26. A cloning or expression vector comprising a nucleic acid molecule according to either of claims 24-25.

27. A host cell transformed or transfected with the vector of claim 26.

28. A transgenic animal that has been transformed by a nucleic acid molecule according to either of claims 24 or 25 or by a vector according to claim 26.

29. A method of preparing a carrier protein according to any one of claims 1 to 10, comprising expressing a vector according to claim 26 in a host cell and culturing said host cell under conditions where said protein is expressed, and recovering said protein thus expressed.

30. A method of production of a carrier protein according to any one of claims 1-10 comprising the steps of:

a) constructing oligonucleotide molecules that encode peptide epitopes;

b) annealing the oligonucleotide molecules to form duplexes;

c) introducing the oligonucleotide duplexes into an expression vector so as to encode a fusion protein;

d) introducing the expression vector into a host cell to allow expression of the fusion protein; and

e) isolating the fusion protein produced from a culture of said host cells.

31. The method of claim 30, further comprising the step of conjugating the fusion protein to polysaccharide.

32. The method of claim 29, wherein the host cell is an *E. coli* bacterium.